CLAIMS

1. A pedestrian protection apparatus for a motor vehicle comprising:

a grill affixed to the front end structure of the motor vehicle,

an actuator coupled to the grill for moving the grill between a retracted position and an extended position, with the grill in the extended position providing impact protection for a pedestrian impacted by the motor vehicle, and

a control unit for controlling the actuator based at least in part on the forward speed of the motor vehicle.

2. The pedestrian protection apparatus according to claim 1 wherein the motor vehicle further includes a bumper located below the grill, the grill positioned forward of the bumper in the extended position and rearward of the bumper in the retracted position.

3. The pedestrian protection apparatus according to claim 1 wherein the motor vehicle further includes a bumper located below the grill, the grill positioned at the forward position of the bumper in the extended position and rearward of the bumper in the retracted position.

4. The pedestrian protection apparatus according to claim 1 wherein the apparatus provides energy absorption upon the impacting of the motor vehicle with the pedestrian to reduce injury to the pedestrian.

5. The pedestrian protection apparatus according to claim 1 wherein the actuator comprises a pinion gear driving a toothed rack with the toothed rack coupled with the grill.

6. The pedestrian protection apparatus according to claim 1 wherein the actuator has elements which mechanically fail to provide energy absorption upon the impacting of the motor vehicle with the pedestrian.

7. The pedestrian protection apparatus according to claim 1 wherein at least two of the actuators are provided for moving the grill.

8. The pedestrian protection apparatus according to claim 1 wherein the grill includes apertures for vehicle headlights.

9. The pedestrian protection apparatus according to claim 1 wherein the grill outside perimeter substantially encompasses the frontal surface of the front end structure of the motor vehicle.

10. The pedestrian protection apparatus according to claim 1 wherein the control unit responds to speed of the motor vehicle such that if the vehicle speed is above a first predetermined threshold and the grill is in the retracted position, the control unit causes the grill to move to the extended position.

11. The pedestrian protection apparatus according to claim 10 wherein the first predetermined threshold is between 10 mph and 35 mph.

12. The pedestrian protection apparatus according to claim 1 wherein the control unit responds to speed of the motor vehicle such that if the vehicle speed is below a second predetermined threshold and the grill is in the extended position, the control unit causes the grill to move to the retracted position.

13. The pedestrian protection apparatus according to claim 12 wherein the second predetermined threshold is about 8 mph.

14. The pedestrian protection apparatus according to claim 1 wherein the control unit responds to speed of the motor vehicle such that if the vehicle speed is above a third predetermined threshold and the grill is in the extended position, the control unit causes the grill to move to the retracted position.

15. The pedestrian protection apparatus according to claim 14 wherein the third predetermined threshold is about 37 mph.

16. The pedestrian protection apparatus according to claim 1 further comprising an impact sensor coupled with the apparatus to detect an impact with the grill in the extended position.

17. The pedestrian protection apparatus according to claim 1 wherein the pedestrian protection apparatus provides energy absorption for a pedestrian in the 25 pound to 250 pound range, struck by the motor vehicle in the 1500 pound to 6000 pound range, at a speed of the motor vehicle between 8 mph and 35 mph.

18. The pedestrian protection apparatus according to claim 1 wherein the control unit operates automatically without intervention by an occupant of the motor vehicle.

19. A pedestrian protection apparatus for a motor vehicle comprising:

a grill affixed to the front end structure of the motor vehicle above a front bumper of the motor vehicle,

an actuator coupled to the grill for moving the grill between a retracted position and an extended position wherein the apparatus provides energy absorption with the grill in the extended position upon the impacting of the motor vehicle with the pedestrian to reduce injury to the pedestrian, and

a control unit for controlling the actuator based at least in part on the forward speed of the motor vehicle.

20. The pedestrian protection apparatus according to claim 19 wherein the grill is positioned forward of the bumper in the extended position and rearward of the bumper in the retracted position.

21. The pedestrian protection apparatus according to claim 19 wherein the grill positioned at the forward position of the bumper in the extended position and rearward of the bumper in the retracted position.

22. The pedestrian protection apparatus according to claim 19 wherein the actuator comprises a pinion gear driving a toothed rack with the toothed rack coupled with the grill.

23. The pedestrian protection apparatus according to claim 19 wherein the actuator has elements which mechanically fail to provide energy absorption upon the impacting of the motor vehicle with the pedestrian.

24. The pedestrian protection apparatus according to claim 19 wherein at least two of the actuators are provided for moving the grill.

25. The pedestrian protection apparatus according to claim 19 wherein the grill includes apertures for vehicle headlights.

26. The pedestrian protection apparatus according to claim 19 wherein the grill outside perimeter substantially encompasses the frontal surface of the front end structure of the motor vehicle.

27. The pedestrian protection apparatus according to claim 19 wherein the control unit responds to speed of the motor vehicle such that if the vehicle speed is above a first predetermined threshold and the grill is in the retracted position, the control unit causes the grill to move to the extended position.

28. The pedestrian protection apparatus according to claim 27 wherein the first predetermined threshold is between 10 mph and 35 mph.

29. The pedestrian protection apparatus according to claim 19 wherein the control unit responds to speed of the motor vehicle such that if the vehicle speed is below a second predetermined threshold and the grill is in the extended position, the control unit causes the grill to move to the retracted position.

30. The pedestrian protection apparatus according to claim 29 wherein the second predetermined threshold is about 8 mph.

31. The pedestrian protection apparatus according to claim 19 wherein the control unit responds to speed of the motor vehicle such that if the vehicle speed is above a third predetermined threshold and the grill is in the extended position, the control unit causes the grill to move to the retracted position.

32. The pedestrian protection apparatus according to claim 31 wherein the third predetermined threshold is about 37 mph.

33. The pedestrian protection apparatus according to claim 19 further comprising an impact sensor coupled with the apparatus to detect an impact with the grill in the extended position.

34. The pedestrian protection apparatus according to claim 19 wherein the pedestrian protection apparatus provides energy absorption for a pedestrian in the 25 pound to 250 pound range, struck by the motor vehicle in the 1500 pound to 6000 pound range, at a speed of the motor vehicle between 8 mph and 35 mph.

35. The pedestrian protection apparatus according to claim 19 wherein the control unit operates automatically without intervention by an occupant of the motor vehicle.